CHARACTERIZATION OF ROOT-KNOT POPULATIONS FROM RICE-WHEAT FIELDS IN NEPAL AND REACTION OF SELECTED RICE AND WHEAT GERMPLASM TO *MELOIDOGYNE GRAMINICOLA*

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Root-knot nematodes (*Meloidogyne* spp.) are important pathogens and can cause significant yield losses on rice and wheat. However, information on the biology and impact of these nematodes on the productivity of rice-wheat systems in Nepal is limited. Identity of 33 isolates of root-knot nematode collected from rice-wheat fields throughout the production regions in Nepal was determined using morphometric measurements of larvae, perineal pattern analysis of mature females, host range tests, symptoms observed on infected roots, and internally transcribed spacer region sequences. Results obtained suggested that all the collected isolates of root-knot nematode were *M. graminicola*, with minor variation in larval measurements, perineal patterns and ITS sequences between isolates collected from the hill and Terai regions. Also, significant variation in the aggressiveness of the isolates was observed on the rice cultivars Labelle and LA 110. In addition, a significant variety by isolate interaction was observed in selected rice and wheat germplasm tested. Generally, root-galling severity and reproduction of the isolates of *M. graminicola* were higher on rice than wheat.

Greenhouse experiments were conducted to verify an effective protocol for assessing the reaction of large number of rice and wheat germplasms for resistance to *M. graminicola*. The effects of inoculum density, inoculation methods, size of planting container, incubation time, and planting seeds or seedlings on the infection and reproduction of *M. graminicola* in rice and wheat were determined. Based on the

results of these tests, the protocol adopted for screening rice and wheat germplasm for resistance to *M. graminicola* was planting seeds in 10- cm pots filled with pasteurized soil (500 cc) infested with 2 or 10 eggs of *M. graminicola*/cc soil, and then incubating for 60 days in a greenhouse at 25 C.

The reaction of 150 and 74 germplasms of rice and wheat, respectively was assessed by determining the root-galling severity and reproduction of the most aggressive isolates of *M. graminicola*. All the rice and wheat germplasms tested were susceptible to *M. graminicola*. However, significant differences in the level of susceptibility of rice and wheat germplasms were observed, as suggested by the ranges in root-galling severity and reproductive values recorded.